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Mr. Richard Schassburger
Rocky Flats Office
U.S. Department of Energy
P.O. Box 928
Golden, Colorado 80402-0928

Subject: **Technical Review Comments on Rocky Flats Plant Draft Standard Operating Procedures (SOPs)**

Dear Mr. Schassburger:

EPA has reviewed the following documents:

1) GT.8, Rev. 3 Surface Soil Sampling SOP;
2) L-7103-A Receipt, Storage and Preservation of Soil Samples for Gamma Spectrometric Analysis; and
3) L-7101-A Analysis of Environmental Water and Soil Samples by Gamma Spectroscopy.

Enclosed are EPA's comments regarding these three documents which were all determined to be generally acceptable and needing only minor revisions. The only exception to this statement is the "grab method" described in Section 4.3 of the Surface Soil Sampling SOP. This method must not be used until it is substantially improved in accordance with our comments. Comments are being consolidated for FO.28, Rev.0 Tank and Pipeline Investigation, and will be submitted to DOE in approximately one week.

If you have any questions or comments on this review, please contact Gary Kleeman of my staff at 294-1071.

Sincerely,

Martin Hestmark

Martin Hestmark, Manager
Rocky Flats Project

Enclosure

cc: Bruce Thatcher, DOE
Mike McHugh, EG&G

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2.0 GENERAL COMMENTS

The following general comments are arranged by SOP.

2.1 GT. 8, REV. 3 - SURFACE SOIL SAMPLING

1. Additional illustrations of the sampling equipment, subsample location procedure, and compositing procedure would improve utility to the document and prevent misunderstandings in the field. Appropriate figures for several procedures have appeared in previous RFP documents and should be included in this SOP.

2. Section 4.3 on grab sampling is inadequate and needs significant improvement to equal the detail provided in other sections. This section relies on other sections within the SOP without specifically citing the sections.

3. Details were not consistently addressed from method to method, such as methods for entering sampling information into log books, decontaminating the samples, labeling the samples, finding the location of the samples, photographing the sample sites, and refilling sample holes. Where applicable, these procedures must be standardized. Adding figures, such as an example sample label in the appendix, would help standardize the document.

4. Photographing sampling locations is listed as a requirement in sections 4.4 through 5.4 of this document. While this is useful in some cases, photographs should not be a requirement of the SOP, but instead left to the discretion of the project manager.

2.2 L-7103-A RECEIPT, STORAGE AND PREPARATION OF SOIL SAMPLES FOR GAMMA SPECTROMETRIC ANALYSIS

1. The document uses both the term "sample cans" and the term "sample containers." Terms should be used consistently to avoid confusion.

2. An additional attachment or section must be added to list all labels and forms that need to be completed during this process.

2.3 L-7101-A - ANALYSIS OF ENVIRONMENTAL WATER AND SOIL SAMPLES BY GAMMA SPECTROSCOPY

1. At several locations within the SOP, missing information denoted by underlined blanks, have been left in the document. The missing information, including the figures for page 111, must be filled in for the final version of the document.

3.0 SPECIFIC COMMENTS

The following specific comments are arranged by SOP.

3.1 GT. 8, REV. 3 - SURFACE SOIL SAMPLING

1. Section 4.0, Page 5, Paragraphs 2 and 3. Paragraph 2 lists four objectives for surface soil sampling at the RFP, but does not explain these objectives in any detail. Paragraph 3 relates the four methods of soil sampling to slightly different objectives than those listed in the previous paragraph. To improve the usefulness of this document, each of the objectives in paragraph 2 must be briefly explained and the appropriate method must be more clearly recommended for these objectives in the following paragraph.

2. Section 4.1.3, Page 7, Paragraph 3. This paragraph describes the method for locating subsample points that will comprise the composite sample for the Colorado Department of Health (CDH) soil sampling method. As presented, the discussion contains several steps that may be difficult to follow. A figure must be included with this discussion to clarify the procedure used to select the subsample plots.

   Rationale: The use of a figure in this section would improve the clarity and reduce sampling errors in the field.

3. Section 4.2.1, Page 9, Paragraph 5. This paragraph describes the jig and scoop used in the RFP soil sampling method. The configuration of the equipment is not clear. A figure of the sampling equipment similar to that provided for the CDH method should be included with the

description of the sampling equipment.

Rationale: A figure of the sampling equipment would clarify the description of the sampling procedure.

4. Section 4.2.3, Page 10, Paragraph 4. This paragraph gives the crew supervisor discretion in selecting a sampling location in the event that all the site selection criteria cannot be met. It must also state that the crew supervisor shall record which of the site selection criteria were not available at the chosen sampling site on the data collection form.

5. Section 4.2.4, Page 11, Paragraph 1. This paragraph describes the method used to locate subsamples for the RFP soil sampling method. The instructions are complex and may lead to confusion in the field. A figure of the subsampling plot location must be included with the description of the subsample plot location.

Rationale: A figure of the sampling plot would clarify the description of the sampling procedure.

6. Section 4.2.4, Page 11, Paragraph 6. This paragraph is part of a series of directions on how to sample with the RFP method. The direction states that the sampler should divide the sieved soil into four subsamples and sample each quarter. The four subsamples are then to be placed into one plastic bag. The present discussion does not explain why the soil is being split into four parts and then combined back together as one sample. Without some explanation, it is unclear if this procedure is correct as stated.

Rationale: An explanation for this process must be included in this paragraph for clarity.

7. Section 4.3, Page 12. This section discusses soil sampling with the grab method. This section is poorly developed. It does not fully explain how to remove the pavement or reference Section 4.5, Surface Soil Sampling Below Asphalt or Concrete, for further instruction. Additionally, if this method is identical to the RFP method, the reader must be referred to exact sections of that method. This method is also missing information on finding

the sample location, determining how the sampling should be recorded in field books, deciding whether photographs will be taken, decontamination procedures between sample locations, and determining whether the sampling hole will be refilled. The section as written may lead to confusion and inconsistent sampling in the field.

Rationale: This section requires substantial improvement to match the detail provided in the other soil sampling method descriptions.

8. Section 4.4.4, Page 14. This section explains the procedures for sampling from the surface downward using the vertical profile method. This section, however, does not discuss backfilling the excavation as other procedures do. If backfilling is not required, it should be stated.

Rationale: The SOP must instruct the sampling crew on all aspects of sampling with this method.

9. Section 4.5.1, Page 17, Paragraph 1. This paragraph provides background information on the sampling of soil beneath asphalt or concrete. It must explicitly state that the FSP will describe the target depth for sample collection beneath the paving because in several areas additional fill may have been placed over the original soil surface before paving the area. Therefore, sampling the first 6 inches of soil under the pavement may not accurately characterize the radionuclide inventory of the original soil. The SOP must clarify that the FSP will discuss potential problems of this type.

Rationale: As written, it is not clear that fill material directly beneath the pavement may not be the material which should be sampled.

10. Section 4.5.4 Page 18, Paragraph 3. This paragraph lists the procedures for surface soil sampling below asphalt or concrete. It instructs the sampler to use a wet vacuum to remove excess water generated during cutting of the cement or asphalt. The procedure list should also include directions for disposal of the potentially contaminated water.

Rationale: As written, it is not clear how the potentially contaminated water will be disposed.

11. Section 4.6.5, Page 21, Step 2. This step in the procedures for sampling cores must also specify that the core itself must be clearly marked to indicate which is the top surface prior to wrapping it in aluminum.

12. Section 4.6.5, Page 21 and 22. This paragraph lists the procedures for sampling the top one-fifth and the bottom one-fifth of the cross-section face of asphalt or concrete samples. Step number 7 asks the sampler to repeat steps 3, 4, and 5. A clearer explanation and a purpose for repeating these steps are needed.

Rationale: The instructions are confusing as presented.

3.2 L-7103-A RECEIPT, STORAGE AND PREPARATION OF SOIL SAMPLES FOR GAMMA SPECTROMETRIC ANALYSIS

1. Section 3.0 Page 4. This paragraph lists special equipment required for the procedure. Section 6.5, however, describes the use of a rotating mill, which is not on the list. A rotating mill must be included on this list.

Rationale: The list should include all equipment.

2. Section 4.0 Page 4. This paragraph lists materials needed for the procedure. Volrath cans and Ziploc bags are needed for the procedure and must be added to the list.

Rationale: The materials are incomplete.

3. Section 5.0, Page 4. This section discusses blank and laboratory control samples. However, it states that the blank samples are not processed with the field samples. Therefore, these would not be true blank samples but rather another form of laboratory control sample. Without a true blank, that is run through the sample preparation procedures, there is no way to measure potential cross contamination between samples or contamination from other sources in the laboratory. A true blank sample must be processed through all the steps used to prepare a field sample for gamma spectrometric analysis.

Rationale: It does not appear from the SOP that a true blank sample is being processed in the laboratory. A true blank must be processed through the laboratory to evaluate possible laboratory derived contamination.

4. Section 6.2, Page 6. This section describes the responsibility involved in accepting samples at the laboratory and uses the acronym "TID." This acronym is not defined and its meaning is unknown.

Rationale: For clarity, all acronyms must be spelled out on first reference in a document.

5. Section 6.4.3, Page 8. This section states that the analyst should weigh the sample without the plastic bag and enter that weight into the lab book under "gross weight." However, section 6.3.2 has already labeled an earlier measurement in the procedure as gross weight. One of these weights should be given a new title.

Rationale: This clarification will avoid confusing the two separate measurements.

6. Section 6.4.4, Page 8. This section states that the analyst should repeat certain steps during the drying process. The current section numbers appear to be wrong and need to be changed.

Rationale: The referenced section numbers are incorrect.

7. Section 6.4.6 Page 8. This section explains the step of placing the sampling can into the drying oven. The maximum number of cans that can be placed into the oven at one time should be specified.

Rationale: It is unclear if more than one sample can be placed in the oven at once.

8. Section 6.4.8, Page 9. This section describes how to cool the sample cans after they have been in the drying oven, but the numbers have no units. Time units need to be added to the numbers in the text.

Rationale: Lack of units may lead to laboratory errors.

9. Section 6.5.10 Page 10. This section describes sample sieving procedures. It also states that several sieving steps are to be repeated. However, the wrong sections (6.28 and 6.29) are cited. The correct sections, 6.5.8 and 6.5.9, must be cited.

Rationale: The referenced section numbers are incorrect.

10. Sections 6.5.15 through 6.5.17, Page 11. This section describes how to pulverize the sample. It is unclear why these steps have been included in the procedure when the sample has already been ground following the steps presented in Section 6.5. The purpose of the steps outlined in Sections 6.5.15 through 6.5.17 must be clarified.

Rationale: The purpose of the steps is unclear.

3.3 L-7101-A - ANALYSIS OF ENVIRONMENTAL WATER AND SOIL SAMPLES BY GAMMA SPECTROSCOPY

1. Section 4.2 and 5.2, Pages 5 and 8. These two sections describe the radioactive standards used in calibration of the system. The shelf lives or expiration dates given for the standards in the two section do not appear to agree. The long lived source described in Section 4.2 has an expiration date 33 months after preparation. However, Section 5.2 states that this source has a shelf life of 2 years. These differences must be reconciled and clarified.